

WHAT IS CLAIMED IS:

1. An apparatus for forming a film on a wafer in a semiconductor process comprising:
an inner part for mounting therein said wafer;
5 an outer part covering said inner part wherein a gas inlet and a gas outlet are formed between said inner part and said outer part; and
a gas-feeding pipe partially mounted inside said gas inlet for adjusting a feeding gas flowing therein in the direction toward said outer part instead of said inner part to prevent particles adhered to said inner part from 10 peeling off.
2. The apparatus according to claim 1 wherein said inner part is a chamber when said semiconductor process is a chemical vapor deposition process.
3. The apparatus according to claim 1 wherein said inner part, said outer 15 part, and said gas-feeding pipe are made of quartz.
4. The apparatus according to claim 1 wherein said inner part, said outer part, and said gas-feeding pipe are made of SiC.
5. The apparatus according to claim 1 wherein said gas-feeding pipe having thereon a plurality of holes on one side near said outer part for 20 passing through said feeding gas.
6. The apparatus according to claim 5 wherein said plurality of holes are gradient holes.
7. The apparatus according to claim 1 wherein a portion of said gas-feeding pipe mounted inside said gas inlet has a length shorter than 70 cm.
- 25 8. The apparatus according to claim 1 wherein a portion of said gas-feeding pipe mounted inside said gas inlet has a length shorter than two-thirds of the length of said inner part.

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9. The apparatus according to claim 1 wherein said gas-feeding pipe having an exit with a specific direction toward said outer part.
10. The apparatus according to claim 1 wherein said apparatus further includes:
- 5 a flow controller mounted to said gas-feeding pipe for controlling a flow rate of said feeding gas in the range of 300 sccm to 2000 sccm;
- 10 a heating device for controlling the reaction temperature of said semiconductor process in the range of 400°C to 850°C; and
- 15 a pumping device for controlling the pressure in said inner part in the range of 0.1 torr to 1 torr.
11. The apparatus according to claim 10 wherein the temperature different between said feeding gas and said inner part is between 600°C to 850°C.
12. A gas-feeding device for feeding a gas into a film-forming apparatus having an inner part and an outer part to form a film on a wafer mounted in said inner part, the temperature difference between said gas and said inner part being ranged from 300°C to 850°C, comprising:
- 15 a gas-feeding pipe partially mounted between said inner part and said outer part for adjusting said gas flowing therein in the direction toward said outer part to prevent particles adhered to said inner part from peeling off, and
- 20 a flow controller connected to said gas-feeding pipe for controlling a flow rate of said gas.
13. The gas-feeding device according to claim 12 wherein said gas-feeding pipe has a length shorter than 70 cm.
- 25 14. The gas-feeding device according to claim 12 wherein said gas-feeding pipe having thereon a plurality of holes on one side near said outer part for passing through said gas.

15. The gas-feeding device according to claim 14 wherein said plurality of holes are gradient holes.

16. The gas-feeding device according to claim 12 wherein said gas-feeding pipe having an exit with a specific direction toward said outer part

5 17. The gas-feeding device according to claim 12 wherein said flow controller controls said flow rate of said gas in the range of 300 sccm to 2000 sccm.

18. A method for feeding a gas into a film-forming apparatus having an inner part and an outer part to form a film on a wafer mounted in said inner part in a semiconductor process, comprising steps of:

(a) feeding said gas into a space between said outer part and said inner part and in the direction toward said outer part to prevent particles adhered to said inner part from peeling off; and

(b) leading said gas into said inner part along a path between said outer part and said inner part.

19. The method according to claim 18 wherein said semiconductor process is one of chemical vapor deposition process and physical vapor deposition process.

20. The method according to claim 19 wherein said film is a silicon nitride
20 film and said particles are Si_xN_4 compounds.

21. The method according to claim 20 wherein said process includes steps of:

(c) controlling the temperature in said inner part of said film-forming apparatus in the range of 600°C to 850°C; and

25 (d) controlling the pressure in said inner part of said film-forming apparatus in the range of 0.1 torr to 1 torr

22. The method according to claim 20 wherein said gas is a purge gas.

selected from a group consisting of nitrogen, argon, and other inert gases.

23. The method according to claim 22 wherein after said film is formed, said process further includes a step of (e) controlling the flow rate of said gas in the range of 300 sccm to 2000 sccm for 5 min to 15 min to

5 devacuum said film-forming apparatus.

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